Bidding Behavior in DoD's Commercial Activities Competitions
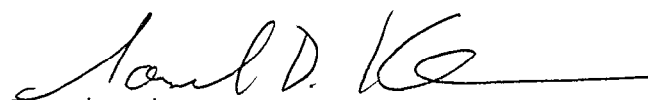
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Contents

Summary

In 1955, the Office of Management and Budget (OMB) implemented a policy known as the Commercial Activities (CA) Program. Originally designed to encourage the use of the private sector, this program now enables the private sector to compete with government organizations in providing goods and services [1]. In CA competitions, the in-house government team as well as outside private contractors submit bids to supply a specified good or service. If the in-house team's bid is no more than 10 percent higher than the minimum contractor bid, the in-house team continues to supply the good or service. When the minimum contractor bid is more than 10 percent lower than the in-house team bid, the good or service is outsourced to the winning contractor. The objective of the CA Program is to promote an efficient support structure through competition. Greater efficiency would allow DoD and the services to spend less money for the same level of support and have more money to spend on operational forces. As a result of the CA Program, DoD initiated 4,311 A-76 competitions from 1978 to 1994 and completed 2,195.[1]

In a previous study [2], CNA analysts used data from past DoD A-76 competitions to construct a model of savings and projected the potential savings from additional DoD CA competitions. In this paper, we use an alternative approach for estimating savings from future DoD CA competitions: We estimate two separate bidding equations-one for the in-house team bid and another for the minimum contractor bids-along with an equation for baseline cost. Based on these estimated equations, one could then indirectly project future

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1. Of the initiated competitions, 381 were consolidated with other studies, and 76 were broken into smaller studies. We counted these competitions as false starts rather than cancellations. This results in an overall completion rate of 59 percent. These calculations exclude 807 simplified cost comparisons and direct conversions.

savings in the A-76 inventory as the difference between predicted baseline cost and the predicted winning bid.

Using our new approach, we project an annual savings of $6 billion (in FY 1996 dollars) if the entire 1995 DoD CA inventory were competed under A-76 rules. This is slightly lower than our previous estimate of $6.2 billion. As before, the savings are highly influenced by the number of billets that a Service declares are commercial. If the other Services had the same percentage as the Navy, which had the largest percentage classified as commercial in the 1995 CA inventory, the savings would roughly double [3]. Thus, a close review of those billets that are not now considered commercial could result in big savings.

We adopt this alternative, more structural, modeling approach for two reasons:

- It allows us to determine whether the source of savings is from low in-house or contractor bids.

- It allows us to simulate the effect of various DoD policy changes on savings.

To summarize the results from simulations of various policy changes:

- Competition is the main source of savings-accounting for 65 percent of total savings.

- Increasing the number of civilian billets in a competition by 1 percent would increase savings by 2 percent.

- Increasing the number of military billets by 1 percent increases savings by 5 percent.

- Constraining the in-house team to bid no more than baseline costs increased savings by 1'7 percent.

- Changing the in-house bidding advantage-in either direction-would have a small impact on savings.

- Moving to the new OMB overhead rate should reveal increased savings, on the order of 22 percent, and should lead to a decline in the number of in-house wins.

In our simulations of various policy changes, we find that competition-not private sector cost advantages-accounts for most of the savings. In particular, we estimate that the competitive forces alone account for 65 percent of total savings. The remaining 35 percent is due to inherent comparative advantages of the private sector and the increased number of bidders. Even if there is no private sector cost advantage, more bidders would lead to a larger expected savings.[2]

Because many in-house teams were effectively constrained not to bid over their original baseline cost, we examined the effect of relaxing such a constraint. We find that constraining the in-house team to bid no more than its current baseline cost increases savings by 17 percent.

Neither increasing nor decreasing the in-house team's bidding advantage from its present level of 10 percent would have a significant impact on savings. This is because only 7 percent of competitions are affected by the rule and, even for these, the impact on savings is small.

A final policy simulation estimated the effect of the new method of accounting for overhead. The new OMB Circular A-76 requires the in-house team to use an overhead rate of 12 percent. Based on the limited data available, it is estimated that during the 1978-to-1994 period the in-house team used an overhead rate of about 5 percent on average. We applied this new overhead rate to both the baseline cost estimate and the in-house teams bid. We find that savings would increase by about 22 percent and that the percent of in-house wins would decrease from 50 to 42 percent. This increase in savings should not be regarded as a benefit from moving from the 5-percent to the 12-percent overhead rule. Rather, it suggests that the old 5-percent rule masked some of the true savings from A-76 competitions. This argument assumes that:

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2. More bidders lead to more savings because each additional bidder has some probability that its bid will be lower than all previous bids. This effect is separate from the competition effect which also increases with the number of bidders (actual orpotential bidders).

- Savings were previously underestimated because the overhead portion of baseline costs was underestimated.

- The new overhead rates were more correct than the old overhead rates.

Since the simulations do not account for the fact that bidding strategies may change under different policies, the results from the simulations should be interpreted as approximations of the true impact of these policy changes.

Background

The A-76 program-past and present

From 19'79 to 1994, DoD completed 2,195 A-76 competitions that resulted in recurring annual savings of approximately $1.5 billion.[3] Despite the program's successes, adverse incentives and political pressures effectively ended new competitions. Figure 1 shows the number of competitions by year.

Figure 1. Completed competitions over time
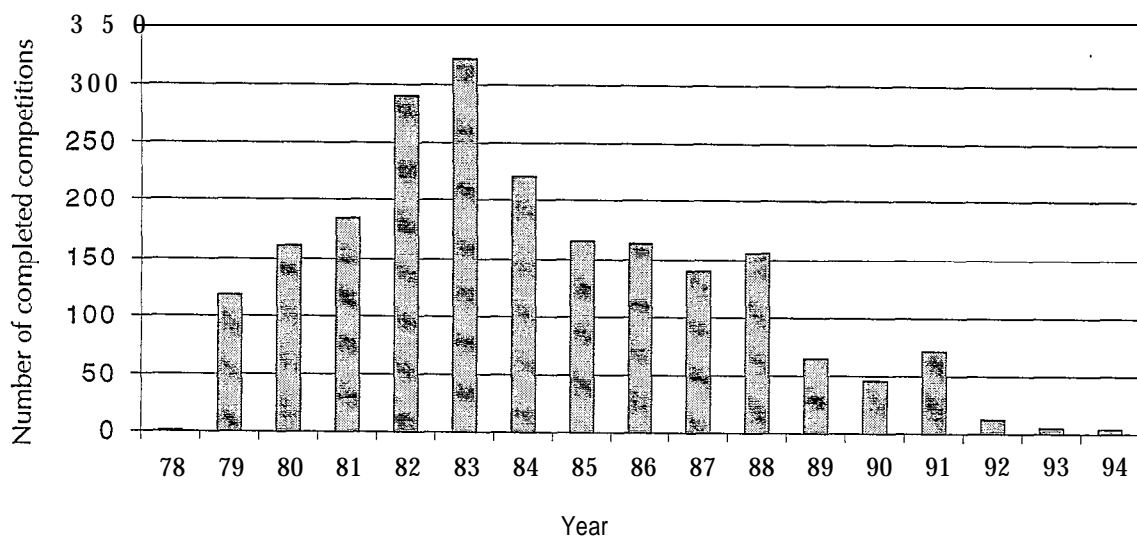
In 1989, installation commanders were given the authority to exempt functions from competitions.[4] Shortly thereafter, the number of new

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3. See [2, 4, 5] for more information.

4. The authority expired in 1995. See [6] for more details.

competitions decreased, and the number of cancellations increased.[5] In FY 1992, Congress imposed a one-year moratorium that stopped the program completely. The Air Force was the only service to restart A-76 competitions after the moratorium expired.

The previous success of the A-76 program-and the need to purchase new weapon systems-has led DoD to initiate a new round of A-76 competitions. The Navy plans to compete 80,500 positions between 1996 and 2002. To date, they have announced about 18,000 positions for competition.

Will the savings materialize?

Difficulties in identifying candidates for competition and past failures from other savings initiatives have raised questions for some Navy officials:

- Can the Navy actually find 80,500 positions to compete?

- Will they see the same level of savings that the program generated in the 1980s?

Predicting is always difficult, and DoD has had many initiatives that have fallen short of the fulfilling their promises of savings. However, compared to many DoD savings initiatives, the A-76 program has a long and successful track record. DoD has undergone tremendous change since the end of the Cold War, but there is no evidence that it is more efficient relative to the private sector.[6] There are additional pieces of information that would be good to have, and DoD can do a better job of tracking the A-76 process and resulting savings. We do not have definite answers to either question, but we do have strong historical experience and some recent experience on which to base our conclusions.

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5. We believe that the large number of cancellations was caused by poor incentives for the installations commander. See [7].

6. DoD may have become more efficient relative to itself, but if the private sector has cut its costs even more, larger savings may be possible today.

Can the Navy find 80,500 candidates?

The PR-99 analysis

As part of the PR-99 budgeting process, an Investment Balance Review (IBR)[7] working group identified potential candidates using Navy manpower databases. They excluded a billet from consideration if:

- The function appeared to be inherently governmental.
- Competing the billet would not lead to savings for the Navy.'
- There were legislative restrictions on competing the function.

They also took sea-shore rotation and homebasing into account for military billets.

Using this process, the group identified 124,000 potential civilian out-sourcing candidates and about 55,000 potential military candidates.[9] The working group concluded that the current plan was aggressive but achievable.

The POM-00 analysis

As part of POM-00 Assessment, an Issue Assessment working group[10] updated the PR-99 analysis with new data and refined rules for excluding billets from consideration. Of roughly 200,000 civilians, 16,000 were already scheduled to be cut between 1998 and 2003. Of the remaining 184,000 civilians, 11 1,000 were thought to be good potential candidates. The Navy needs to be able to compete about

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7. This group included representatives from N47, N12, N80, N81, N82, CNA, and NAVMAC Civilian Pay Office.

8. For example, many medical billets are paid for by the Office of the Secretary of Defense (OSD).

9. Only 23,000 out of 55,000 military positions can be competed due to sea-shore rotation homebasing policies.

10. This group included representatives from N80, N81, N82, N47, N12, N43, CNA, RDA(I&E), and DONOMIT.

63 percent ('70,500) of these 111,000 to meet its goal for civilian candidates.

Using the same process, the group identified 58,000 potential enlisted military candidates out of the roughly 314,000 enlisted billets. An average sea-shore rotation goal of 4:3 reduced the number of candidates to about 13,000 (rather than the 23,000 identified by PR-99). Eliminating all fleet concentration billets further reduced the number of enlisted candidates to about 8,000. Combining these 8,000 with the 2,000 already announced would make the Navy's goal seem possible but very aggressive. However, the following facts suggest that the estimate of 8,000 enlisted candidates is too conservative:[11]

- These numbers do not include any officer billets. (CNA has estimated that there are at least 4,000 officer billets available.)

- Targeting only nonfleet concentration area billets will actually lead to a higher homebasing ratio than exists now. If the 13,000 enlisted candidates are distributed as all other shore billets, then they could all be competed and be neutral to homebasing.

- All A-school instructors were excluded.[12]

- The way sea-shore rotation is measured is questionable.[13]

- Greater use of a sea pay premium would relax the sea-shore constraint. This option would reduce net savings to some extent.

- Competing overseas shore and neutral duty billets will lessen the sea-shore constraint.[14]

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11. See [8] for further information.

12. See [9] for innovative ways of privatizing training.

13. In particular, the current calculation includes some E5s in their fourth and fifth years who are not careerists. Also, any additional at-sea reductions from Smart Ship initiatives are not factored into the calculations. See [10] for additional information.

14. Some overseas shore billets are counted as sea billets in the sea-shore ratio.

- High savings may justify relaxing one or both constraints. (The alternative is to buy fewer ships and planes or to sacrifice readiness.)

CNA's conclusion

The conclusion we draw from both the PR-99 and PQM-00 analysis is that there appear to be 80,500 candidates. This is a difficult but achievable goal. We do not imply that this high-level analysis is the best method to identify candidates—that should be done at the claimant or installation level where better information is available. On further inspection, some of the 111,000 civilian and 58,000 military enlisted candidates may prove to be poor candidates, and some of the billets that were excluded may have been good candidates. However, this analysis does provide evidence that the Navy should proceed with its competition plan, and it is a valid basis for allocating competition goals to claimants.

Will the program produce 30-percent savings?

We find no evidence to suggest that savings will be substantially lower. In particular:

- The savings per billet competed had a slight positive trend across the 1980s. (This is evidence against cherry picking, the idea that the competitions yielding the highest savings were performed first. If the Navy had engaged in cherry picking, then savings would have a downward trend.)

- The competitions that were cancelled were comparable to successfully completed competitions. (This suggests that many good candidates remain.)

- Competition was applied unevenly across installations and functions which again suggests that many good candidates are still available. (It is also more evidence against cherry picking.)

- The number of personnel has come down in proportion to the budget. (Increased efficiency would imply a sharper drop in personnel.)

- The Air Force continues to average 34percent savings.

- Three recently completed Navy competitions all resulted in savings of at least 30 percent.[15]

The savings are possible but not guaranteed

The savings are possible, but achieving them requires considerable effort and leadership. Leaders need to use every opportunity to state what must be done and why it must be done. There are many disincentives in the system that lead people to resist if they sense that their leaders do not fully support competition and outsourcing. The following actions would increase the chances of success:[16]

- *Increase the involvement and commitment of leaders at all levels.*

- *Fully fund studies.* The current $2,000 per FTE does not appear adequate to cover all costs.

- *Improve incentives.* Letting claimants keep a fraction of savings for a limited time would be an important incentive.

- *Do not penalize aggressive claimants.* Budget cuts should be based on a claimant's potential to compete billets rather than actual efforts. Otherwise, claimants who are aggressive in pursuing competition will be penalized.

- *Focus on larger competitions.* Thirty-seven percent of competitions with ten or fewer positions had zero savings.

- *Improve and expand tracking.* A substantial amount of useful information was collected during the 1980s; however, a lot of valuable information was not collected or was unusable. For example, we need more information on study costs, reasons for cancellation, workload, number of bidders, and recompetitions. There should also be a better database of candidates. Good tracking could also lessen the probability of a competition falling behind or being cancelled.

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15. These competitions were fuel services at Guam, telecommunications in Stockton, and family services in San Diego.

16. Additional ideas and more specific suggestions will be incorporated into a forthcoming paper on improving the Navy's competition process. Also, see [7].

Descriptive statistics

Previously completed A-76 competitions

Table 1 provides descriptive statistics for completed A-76 competitions. Of the 2,195 completed competitions, we examined 2,069.[17]

Weighted averages are presented by military service, size, and function type. The first column is the number of competitions in each group. The Navy and Air Force completed the most competitions. The breakdown by size shows that most competitions were small. Interestingly, an A-76 competition was not required for competitions of ten or fewer civilian positions, but the full A-76 process was often used to justify even these outsourcing decisions. The last breakdown is by function, and it shows that Installation Services and Other Non-manufacturing were the most commonly competed.

The second column shows the percentage won in house. About half of all competitions were won in-house. The third, fourth, and fifth columns provide information on the billets (military and civilian positions) associated with each competition. These competitions in total represented about 77,000 positions of which about 78 percent were civilian.

The last four columns provide information on the savings associated with each competition. About 40 percent of the competitions were for fewer than 10 billets, but these competitions accounted for only 5 percent of total savings. Of the completed competitions, 439, or 21 percent, yielded no savings. This suggests that some tasks may be efficiently undertaken by the in-house team without exposure to·competitive private markets. Or, it could mean that these competitions

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17. Of the 126 competitions not used in the analysis, 119 were missing vital data, 4 were outliers, 2 were unusual cases (unique functions), and 1 contained an apparent typographical error.

were structured in a way that made it difficult for the private sector to find efficiencies. For example, a small competition involving five billets and a performance work statement (PSW) that specifies procedures rather than products could make it difficult for the private sector to bid effectively. In these cases, the Navy can bundle small functions together and write a more flexible PSW.

Table 1. Descriptive statistics for completed A-76 competitions[a]

| | Number of competitions | Percent won in-house | Billets | | | Annual savings (1996 dollars) | | | 'ercent with no savings |
			Total	Per task	Percent military	Total (in millions)	Per billet (in thousands)	Per task (in thousands)	
By service branch									
DoD Agencies	50	42.0	1,034	21	0.5	13	13.0	270	16
Army	445	50.1	23,588	53	14.1	432	18.3	970	21
Air Force	732	37.1	26,080	36	32.9	560	21.5	765	14
Marines	39	53.8	1,264	32	12.4	23	18.5	600	26
Navy	803	56.8	25,391	32	19.0	412	16.2	513	28
By size (number of billets)									
1-10	833	57.1	4,626	6	10.7	72	15.6	87	36
11-50	915	41.4	21,081	23	11.1	377	17.9	412	13
51-100	174	46.0	12,086	70	13.6	189	15.7	1,088	8
101-150	52	50.0	**6,115**	**118**	**17.8**	**17.1**	**19.8**	2,330	4
151-200	32	50.0	5,605	175	12.9	99	17.7	3,108	9
More than 200	63	31.7	27,844	442	38.1	581	20.9	9.229	2
By function type									
Installation Services	647	52.6	26,806	41	9.4	504	18.8	779	24
Social Services	230	19.1	4,198	18	12.6	68	16.2	296	14
Health Services	27	74.1	436	16	17.9	4	8.2	133	41
Intermediate Maintenance	159	40.9	15,575	98	45.1	285	18.3	1,791	23
Depot Maintenance	6	100.0	86	14	0.0	1	11.7	168	50
Real Property Maintenance	312	44.9	10,493	34	8.5	208	19.8	666	17
Research Support	12	25.0	984	82	76.2	68	**69.1**	5,670	8
Training	8	50.0	1,232	154	91.9	21	17.4	2,678	0
Data Processing	94	56.4	2,150	23	14.3	23	10.6	243	33
Other Nonmanufacturing	574	56.1	15,391	27	23.1	259	16.8	451	20
Total	2,069	48.2	**77,357**	37	21.8	1,440	18.6	696	21

a: Savings are measured in thousands of FY 1996 dollars on an annual basis

For 68 of the competitions with zero savings, however, the private contractors submitted a bid lower than the baseline cost, but were prevented from winning by the in-house team's lo-percent bidding advantage. If we only include competitions with no bids below the base cost, the percent with zero savings drops 18 percent.

Comparison of bids

Figure 2 shows the distribution of bids relative to the original cost for the in-house team and the lowest contractor bid. Along the horizontal axis in figure 2, a "1" means that the bid is equal to the baseline cost. A number less than 1 means that the bid is lower than baseline cost. A number greater than 1 means that the bid is greater than baseline cost. The "2" on the horizontal axis is "2 or more" times the baseline cost.

Figure 2.   Distribution of bids relative to original cost
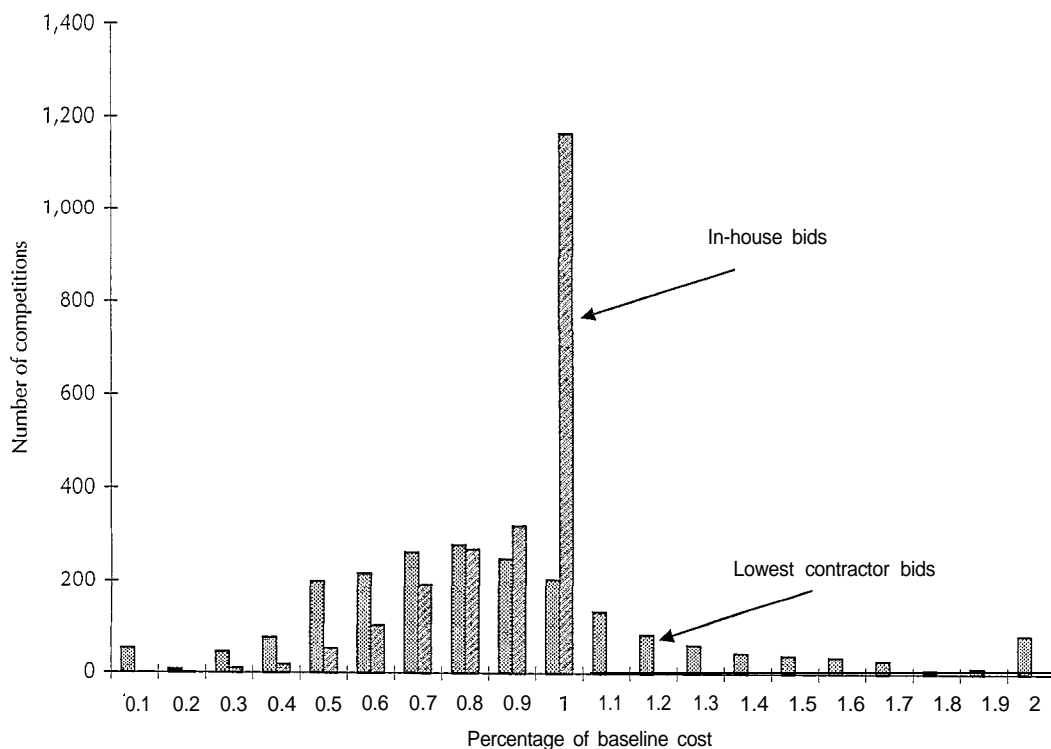
The fact that there are no in-house bids above the original cost is dictated by the rules of the A-76 process. This probably explains why many of the in-house bids are equal to the original cost of performing the task. On the other hand, the mode for the lowest contractor bid is at 80 percent of the original cost, and many bids are below that. (In figure 2 note that the "2" on the horizontal axis is "2 or more.")

That the in-house team is bidding at less than the original cost can be attributed to the increase in competitive pressures. However, the lower mean for contractor bids cannot simply be attributed to greater inherent efficiency of private versus in-house provision. This is because the private bids in figure 2 are for the lowest and not the average bids received. In a sense, we have a distribution of potential private and in-house bids where we receive a number of private bids, select the lowest, and then compare it to the in-house bid. Even if the contractor and in-house bids come from the same distribution, the lowest contractor bid will, on average, be lower than the one in-house bid.

Figure 3 shows a scatter plot for each competition of the savings relative to the baseline costs for the lowest contractor bid compared to the in-house bid. Again, the in-house savings cannot be negative due to the rules of A-76 competitions. We have truncated the savings from lowest contractor bids at -100 percent. Each dot represents a pair of bids for the same competition. Thus, they can be compared to see which bid gave greater savings and which bid won. (Recall that the winning bid need not provide the greatest savings of the two since the lowest contractor bid must be at least 10 percent less than the in-house team's bid to win.)

Note the wide dispersion of the data. This indicates that the two bids were often quite different and, thus, even if one bid would result in savings, the other bid would not. Any points along the vertical axis above zero are places where there were no savings from the in-house bid, but the lowest contractor bid did produce savings. For all points below the horizontal axis and to the right of the vertical axis, the in-house bid produced savings, but the lowest contractor bid did not. All points between the two dark lines are cases where the contractor bid was cheaper, but the in-house team won because of its lo-percent bidding advantage.

Figure 3.   Bid comparison scatter plot

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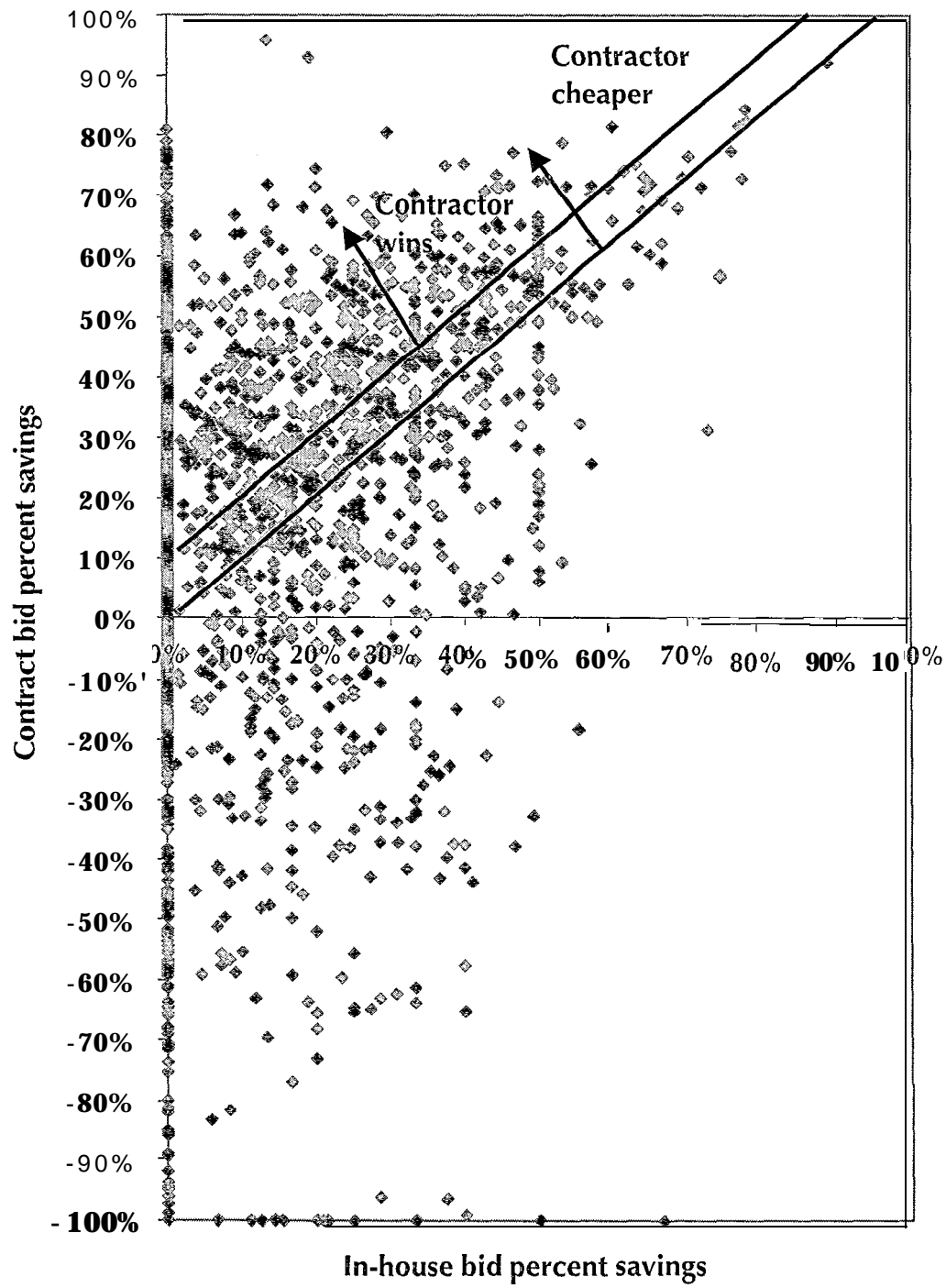
The 1995 DoD CA Inventory

The 1995 DoD CA Inventory is a list of candidates from which future competitions can be drawn. Table 2 lists descriptive statistics for this inventory. Later, we project savings from competing the entire inventory.

Overall, the inventory is very similar to those functions already competed. However, there are some differences:

- The average function is smaller.

- DoD agencies are more prevalent.

- Some functions have had only a very small percentage of billets competed (Health Services, Depot Maintenance, Research Support, and Training).

- The inventory is 37-percent military compared to the 22 percent of previous competitions.

Table 2. Descriptive statistics for the 1995 DoD CA Inventory

	Number of tasks	Billets		
		Total	Per task	Percent military
By service branch				
DoD Agencies	1,280	52,824	41.3	4.0
Army	3,712	96,217	25.9	27.9
Air Force	3,873	49,089	12.7	55.5
Marines	523	19,082	36.5	56.0
Navy	3,941	162,718	41.3	45.6
By size (number of billets)				
1-10	7,897	31,198	4.0	29.8
11-50	3,896	90,947	23.3	34.7
51-100	923	64,560	69.9	38.3
101-150	265	32,544	122.8	38.9
151-200	113	19,378	171.5	59.8
More than 200	235	141,423	601.8	36.4

Table 2.   Descriptive statistics for the 1995 DoD CA
            inventory (continued)

	Number of tasks	Billets		
		Total	Per task	Percent military
By function type				
Installation Services	3,619	90,950	25.1	30.9
Social Services	2,020	26,774	13.3	**13.9**
Health Services	1,369	64,852	47.4	63.3
Intermediate Maintenance	1,069	35,334	33.1	73.5
Depot Maintenance	139	43,869	315.6	1.7
Real Property Maintenance	917	18,367	20.0	8.2
Research Support	242	8,748	36.1	27.2
Training	618	24,253	39.2	81.0
Data Processing	706	14,505	20.5	14.7
Other Nonmanufacturing	2,630	52,398	19.9	30.5
Total	13,329	380,050	28.5	37.2